



BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive, P.O. Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.nmenv.state.nm.us



RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: August 16, 2010

Subject: Pre-CERCLIS Screening Assessment of the Section 32 mine
(Grants Mining District), McKinley County, New Mexico: further
action under CERCLA recommended

| | | | |
|-----------------------|-----------------|--------------------------|-------------------------------|
| Site name | Section 32 mine | Alternative names | UP+HP, Section 29, Section 31 |
| Street address | not applicable | City | not applicable |
| Zip code | not applicable | State | New Mexico |
| Latitude | 35.403 | County | McKinley |
| Longitude | -107.815 | TRS | T14N, R9W, s. 32 |

Site physical description:

The Section 32 mine ("Site") is located approximately 5 miles southeast of the junction of State highways 509 and 605. In a 1980 inspection, a headframe was still present at the Site, and the mine was considered to be inactive, and not abandoned (Ref. 1, p. 16-17). A 1995 inspection report (Ref. 2, p. 12) indicates that the minesite comprised a 60 acre area where the mine headframe had existed, with all other remaining mine workings underground. Based in part upon this report, the New Mexico Energy, Minerals and Natural Resources Department released Homestake Mining Company from further requirements of the New Mexico Mining Act (Ref. 2). Previously, the New Mexico Land Commission officially terminated Homestake Mining Company's lease pending this approval (Ref. 2, p. 12).

Site identification:

The Site is one of numerous legacy uranium sites within the Grants Mining District.

Site summary:

A vertical shaft for the mine was completed in 1958 to a depth of 651 feet in order to access a multi-layered uranium deposit below the water table within the Westwater Canyon member of the Morrison Formation. The ore had low lime and vanadium contents (Ref. 1, p. 16), and averaged 0.20% uranium oxide (Ref. 3, p. 3). At least some production came from ore underlying sections 29 and 31; Ref. 3 indicates that these deposits may

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have mined by Kermac Nuclear and Kerr-McGee (Ref. 3, p. 2-4). However, New Mexico Energy, Minerals and Natural Resources Department Mining Act Reclamation Program Prior Reclamation records indicate that the Section 32 mine always was operated by Homestake and various partnerships in which it was participant (Ref. 4). Through 1970, the Section 32 mine had produced over 1.9 millions pounds of uranium oxide from over 488 thousands tons of ore (Ref. 3, p. 3). Water from the mine was pumped into ponds. There were no surface water features in the section; surface drainage was to an unnamed tributary of the Arroyo del Puerto. Structures that existed during the operational period included an access road, vertical shaft, ventilation borehole, hoist house, office and change room building, and a dewatering pond or ponds (Ref. 2, p. 12).

Reclamation was conducted by an independent contractor in August 1991, and the Site was afterwards grazed as required under the lease agreement with the State of New Mexico (Ref. 2, p. 12). Reclamation proceeded in 3 phases, and included removal of buildings, hoist, and headframe; sealing of the vertical shaft and borehole; and trash removal. The boreholes were backfilled to within 5 feet of the surface, with casings cut-off at 4 to 8 feet below the original ground surface. All but one borehole was topped with a 2-foot thick, reinforced concrete cap; one borehole had a steel plate welded to the top of the casing. The vertical shaft was backfilled to within 2 feet of the surface and capped with a reinforced concrete cap. The ponds were filled with material from containment berms, and the surface was graded to create a smooth surface. Waste piles were reshaped, covered with top soil, and contoured for natural drainage (Ref. 5, p. 32-3 to 32-4). An area labeled "runoff collection ponds" located to the west of state highway 509 and southwest of the Section 32 minesite (Ref. 6, Figure 1) also was reclaimed during these activities (Ref. 5, Figure 8). Finally 60 acres were reseeded using a drill seeder and mulch (Ref. 5, p. 32-4).

Homestake Mining Company included this minesite in its nomination for 1997 "Excellence in reclamation" awards (Ref. 7).

Targets:

The Site is indicated to be located within 200 feet of a ditch, and within a mile of the Arroyo del Puerto.

Wells that are registered with the New Mexico Office of the State Engineer and located within a 4-mile radius of the Site are shown in the table following (Ref. 8).

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| Distance from Site (miles) | OSE record number | Owner's last name | use | finish date | depth of well (ft) | depth to water (ft) | casing diameter (in.) | yield (gpm) |
|----------------------------|-------------------|--------------------------------|-----|-------------|--------------------|---------------------|-----------------------|-------------|
| 1.0 – 2.0 | B 00522 | UNITED NUCLEAR-HOMESTAKE PTNRS | MON | 02/07/1978 | 70 | 0 | | |
| | B 00522 | UNITED NUCLEAR-HOMESTAKE PTNRS | MON | 02/07/1978 | 70 | 0 | 5.0 | 0.0 |
| | | | | | | | | |
| 2.0 – 3.0 | B 00366 | RIO ALGOM MINING LLC | MIN | 12/31/1955 | 760 | 0 | 4.5 | 10.0 |
| | B 00371 | SABRE-PINON CORPORATION | MIN | 08/25/1956 | 752 | 0 | 8.63 | 100.0 |
| | B 00994 | RIO ALGOM MINING LLC | MIN | 09/18/1958 | 857 | 0 | | |
| | | | | | | | | |
| 3.0 – 4.0 | B 00363 | RIO ALGOM MINING LLC | MIN | 04/30/1956 | 745 | 0 | 4.5 | 20.0 |
| | B 00372 | SABRE-PINON CORPORATION | MIN | 09/12/1956 | 796 | 0 | 8.63 | 75.0 |
| | B 01190 | MARQUEZ | STK | 08/31/1989 | 390 | 37 | | 15.0 |

MIN -- MINING OR MILLING OR OIL

MON -- MONITORING WELL

STK --72-12-1 LIVESTOCK WATERING

Site ownership and Potential Responsible Parties:

Homestake-New Mexico operated the mine between 1958 and 1961 (Ref. 3, p. 3). Between 1961 and 1968, operations were conducted by the Homestake-Sapin Partners. United Nuclear-Homestake Partnership operated between 1968 and 1981. Homestake Mining Company-Grants, which was later renamed Homestake Mining Company-California, became operator of the mine from 1981 until 1982 (Ref. 2, p. 12; Ref. 3, p. 3-4). In total, the mine operated between 1958 and 1979. The surface and mineral estate is owned by the State of New Mexico (Ref. 2, p. 12).

File review:

Files that were reviewed for this assessment are listed below.

Site reconnaissance:

The last documented Site reconnaissance occurred in 1995 (Ref. 2).

Recommendation:

The Site should be assessed for surface and radioactivity hazards to determine if surface reclamation has been effective in the long-term elimination of such threats to human health and the environment. Additionally, the capping of shafts and boreholes should be evaluated to determine their long-term effectiveness toward preventing potential contaminant migration to ground water. NMED also recommends assessment of sediments in the Site vicinity in order to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water was pumped from the Section 32 mine in order to access the ore deposits, but the final disposition of the discharged effluent is not known. A generalized investigation of potential alluvial ground water impacts from "wet" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. If this generalized investigation were to indicate a potential for alluvial ground water impacts, on-Site installation of one or more monitor wells then should be considered.

Data from other former "wet" mines suggest that repressurization of the ore-host Morrison Formation, following cessation of pumping for mine dewatering, may be causing mobilization of uranium and associated minerals, and consequent degradation of ground water quality, due to influx of oxygenated ground water. The potential for such impacts, on both regional and site-specific scales, should also be assessed and characterized.

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1. Anderson, Orin J., 1980(?). "Abandoned or inactive uranium mines in New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 148.
 2. New Mexico Energy, Minerals and Natural Resources Department, September 29, 1995. "RE: Prior reclamation release, Section 13, 14, 23, 25, and 32 mines, McKinley County, New Mexico." Letter from Kathleen A. Garland, Director (NMEMNRD/MMD) to Fred Craft, Resident Director, Homestake Mining Company of California). Includes the report: "Homestake Mining Company—California, September 26, 1995. Prior reclamation inspection report and recommendation for release or permit requirement."
 3. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.
 4. New Mexico Energy, Minerals and Natural Resources Department, August 16, 2010. "RE: section 32 mine-MARP Prior Rec files." Emailed edits from Susan Lucas-Kamat (NMEMNRD) to David L. Mayerson (NMED).
 5. Homestake Mining Company of California, August 29, 1994. "Reclamation report, Section 32 mine."

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6. New Mexico Energy, Minerals and Natural Resources Department, August 15, 1995. "Prior reclamation inspection report and recommendation for release or permit requirement, Homestake Mining Company of California—Section 32 mine."
 7. Homestake Mining Company of California, July 25, 1997. "Re: Nomination for Excellence in Reclamation awards in 2 categories: Category: Existing Mine Reclamation – 4 sites are nominated; Category: Voluntary Reclamation – Part of 1 mill site is nominated."
 8. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.